(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 032 839**
B1

(12) # EUROPEAN PATENT SPECIFICATION

(45) Date of publication of patent specification: **16.05.84**

(51) Int. Cl.³: **A 47 C 3/12**

(21) Application number: **81300243.3**

(22) Date of filing: **20.01.81**

(54) **Chair shells.**

(30) Priority: **21.01.80 GB 8001981**

(43) Date of publication of application:
29.07.81 Bulletin 81/30

(45) Publication of the grant of the patent:
16.05.84 Bulletin 84/20

(84) Designated Contracting States:
AT BE CH DE FR GB IT LI LU NL SE

(56) References cited:
FR-A-1 192 386
FR-A-2 314 692
GB-A-1 294 091
US-A-3 014 762
US-A-3 034 830
US-A-3 768 863

(73) Proprietor: **Watkin, Bernard Curtis**
32 West Square
London SE11 (GB)

(72) Inventor: **Watkin, Bernard Curtis**
32 West Square
London SE11 (GB)

(74) Representative: **Brown, David Alan et al**
MATHYS & SQUIRE 10 Fleet Street
London EC4Y 1AY (GB)

EP 0 032 839 B1

Courier Press, Leamington Spa, England.

Description

This invention relates to chair shells.

It is desirable that a chair should be shaped to provide support for the spine and thighs of someone sitting on the chair so that the spine is supported in the orthopaedically preferred position. This position is described in British patent specification 1 294 091 and in the brochure "S Range" published in the United Kingdom by Arenson International Limited of St. Albans. Ideally, the sitter's spine should be supported in an approximately vertical elongate "S" shape whose curves define a plane transverse to the back support of the chair, the lower curve being concave to the back support and being defined by the lumbar and lower thoracic vertebrae while the upper curve is convex and is defined by the upper thoracic and cervical vertebrae. The "S" shape results in less pressure on the chest and contents of the abdomen and so improves breathing, cardiac function and digestion. It also reduces strain on the muscles, ligaments and bones of the spine and pelvis so that less restlessness occurs as a result of the sitter instinctively trying to correct bad posture. The "S" shape also gives a better pressure distribution over the skin, and reduces pressure on the intervertebral discs, lessening the risk of causing or aggravating disc disorders. It is also desirable to give support to the lateral regions of the sitter's back on either side of the spine by using a back support which is concave in horizontal section, as described in patent specification 1 294 091.

It is also desirable that pressure on the ischial tuberosities of the sitter be reduced. Support of the spine in the "S" shape achieves this to some extent by transferring some of the load on the ischial tuberosities to the underside of the thighs. It is also desirable, particularly with such a transfer of load to the thighs, to avoid compression of blood vessels and nerves which pass through the popliteal space, and this can be achieved by using a seat pan which dips towards the front, as described in the above-mentioned brochure.

In upholstered chairs, the chair shell can be covered with upholstery of a shape and compressibility suitable for blassing a sitter into the orthopaedically desirable positions. This is not possible in a non-upholstered or lightly upholstered chair. It would be possible to make a rigid chair with the back rest formed to include a lumbar support in the shape defined in the above-mentioned patent specification 1 294 091, but such a chair would only be suitable for a limited range of people, since the surface of the chair would not be capable of taking up the albeit relatively small changes of shape necessary to provide the desirable support to people of different sizes. Moreover, in the case of stackable chairs, it has been found that stable stacking is only possible if the chair shells approximate closely to an "L" shape and this precludes detailed contouring of the shell to any great degree.

United States patent No. 3 034 830 describes a chair shell of resilient plastics having a back support and a seat, the back support having an upper part which, seen from the front, is convex in vertical section and concave in horizontal section, and which, when flexed under pressure from the back of a sitter, is resiliently deformed to increase its convexity in vertical section and concavity in horizontal section. This is achieved by the "bucket" shape of the chair shell, which has upwardly extending concave side sections connecting the seat and the back support, and is designed to enable the chair shell to conform to the shape of the sitter. It does not enable the back support to be deformed in a controlled manner to a shape which tends to support the sitter's spine in the desired configuration. The lower part of the back support is joined at the seat through a smooth concave curve, which would tend to push the lower part of the spine of the sitter forwards, and so prevent it from taking up the preferred "S" shape. Moreover, there is nothing in the chair shell to reduce pressure on the ischial tuberosities, and the front of the seat is made more rigid by a lip portion, which is undesirable for the reasons given above.

United States patent 3 768 863 describes a moulded chair shell having an aperture formed in the lower part of the back support. However, the chair shell is of rigid plastics, the only flexibility being that which allows the back support to deflect slightly relative to the seat.

United States patent 3 014 762 describes a chair shell formed by bending a single blank of sheet metal or plastics into a conical shape. The blank is provided with rows of perforations to increase its flexibility to enable it to be bent into shape. The final shape of the chair shell is determined by the base or support for the shell.

French patent specification No. 2 314 692 describes a base for a vehicle seat, in which resilience is obtained by providing a longitudinal slit and a number of transverse slits in an upwardly convex portion of a sheet forming the seat base, to avoid the need for the normal spring suspension of a vehicle seat.

It is an object of the present invention to provide a chair shell which gives appropriate support to the sitter whilst retaining sufficient resiliency to accommodate people of different sizes, without the need for a relatively thick layer of upholstery.

This invention consists in a chair shell of resilient material comprising a back support (12) and a seat (14), the back support (12) in its undeformed state having a shape which, seen from the front, is flat or slightly convex in vertical section and is flat or slightly concave in horizontal section, the back support (12) having an upper part which, when flexed under pressure from the back of a sitter is resiliently deformed to increase the convexity in vertical

section and the concavity in horizontal section of the back support (12), characterised in that the upper part of the back support (12) has zones of weakness arranged to modify the deformability of the back support (12) so as to control the resilient deformation of the upper part of the back support (12) under pressure from the back of a sitter, whereby the deformed shape of the back support includes, in vertical section, a convex curve positioned to support the sitter's spine in a convex curve in the lumbo-sacral region, the chair shell has an opening (16) at the junction of the back support (12) and seat (14), the back support (12) has a lower part divided into two portions (26) by a centrally disposed slit (24) which extends upwards from the opening (16), the two portions (26) being adapted to flex resiliently under pressure from the back of a sitter in such a manner that the lower edges of the two portions (26) move backwards to increase the convexity of the back support (12) in vertical section and the inner edges of the two portions (26) move backwards to increase the concavity of the back support (12) in horizontal section, and in that the seat (4) has a rear portion (44) adapted to be deformed resiliently downwards under pressure from the ischial tuberosities of the sitter, and a front portion (52) adapted to be deformed resiliently downwards under pressure from the under-thighs of the sitter.

It has been found that by suitably arranging the zones of weakness in the back support the chair shell is enabled to deform resiliently under the pressure of a sitter into a shape which tends to support the sitter's spine in the preferred shape. The resilient rear portion of the seat provides a reduction in pressure in the ischial tuberosities, in addition to that resulting from the support given to the spine. The resilient front portion of the seat acts to reduce pressure on the blood vessels and nerves passing through the popliteal spaces.

It has further been found that the deformability of crystalline homopolymers of propylene and of similar copolymers of propylene permits an accurate gradation in deformation which is virtually totally recoverable when the sitter stands up and which shows little if any deterioration with length of service of the chair provided the polypropylene is not subjected to excessive oxidative degradation.

Accordingly, the chair shell of the invention is preferably moulded from a crystalline propylene polymer which may be a homopolymer or a copolymer with up to about 18% (by weight of the copolymer) of ethylene, especially sequential copolymers made by injecting ethylene into the latter stages of an otherwise homopolymerisation of propylene. The propylene polymers may be blended with, for example, up to 20% (by weight of the blend) of a rubber, preferably an optionally diene-modified random copolymer of ethylene and propylene. The resilience of crystalline propylene polymers enables controlled deformation of the chair shells when the sitter sits down followed by almost immediate recovery when the sitter stands up. So, for example in making stackable chairs, by choosing propylene polymers, the chair shells can be moulded in the approximate "L" shape needed for stable stacking yet they can be controllably deformed to provide comfort inducing support and then they can recover their "L" shape for stacking.

The zones of weakness may be provided by, for example, open or blind holes, or grooves or slits formed in the chair shell or by reducing the thickness of the thermoplastics material in the zone. Holes or slits may be made in predetermined shapes which assist the deformation of the shell into the appropriate shape. Alternatively, the zones of weakness may be provided by increasing the rigidity of other parts of the chair shell, for example by reinforcing the other parts by ribs. The precise amounts of weakening will depend on the rigidity of the particular thermoplastics material chosen and on the dimensions of the chair shell.

The back support may be extended upwards to provide a neck and/or head support. The head support may be provided with localised weakening to assist in the conformation to the contours of the neck and head. When the chair is in the form of a vehicle seat the weakening can be arranged to prevent the resiliency of the head-rest portion of the seat from contributing to "whiplash" injury to the neck of the sitter.

The invention will now be described, by way of example, with reference to the drawings of which:—

Figure 1 shows a perspective view of a chair shell in accordance with the invention,

Figure 2 shows a central vertical transverse section of the shell shown in Figure 1 and a side elevation of a spine in the orthopaedically preferred position for sitting; and

Figure 3 shows a frame to which the chair shell may be fixed.

Referring to the drawings, a polypropylene chair shell 10 consists of a back support 12 and seat 14. The back support 12 and seat 14 define an "L"-shape suitable for use in a stackable chair. The back support 12 is slightly concave in horizontal section and in vertical section has a lower portion 20 which is substantially perpendicular to the seat 14 and an upper portion which curves backwards. The seat 14 is slightly concave in a section taken on a line extending from side to side of the chair shell and in a section taken on a line extending from front to rear is substantially flat apart from a downwardly curved front portion 52. At the junction of the back support 12 and seat 14 the chair shell is formed with an aperture 16 which extends almost to the lateral edges of the back support 12 and seat 14.

The natural deformability of the back support 12 is modified in such a manner that when a

person sits on the seat the back support 12 is deformed into a shape more closely approximating to the preferred shape discussed above. To this end, the lower portion 20 of the back support 12 is formed with two slits 22 extending upwards from the aperture 16 near the lateral edges of the back support and a third slit 24 extending upwards from the aperture 16 and positioned centrally between the slits 22. The two portions 26 of the back support 12 between the central slit 24 and the respective side slits 22 can flex downwards, and their flexibility is enhanced by a line of weakness provided by a series of small holes 28 extending horizontally above the slits 22 and 24. A larger diameter hole 30 in each of the portions 26 increases the softness of each portion.

In the upper part 18 of the back support 12 a central line of holes 32 extends upwards from a point above the central slit 24. On each side of the holes 32 is a line of holes 34 extending diagonally from a point near the top of central slit 24 to a point near one upper corner of the back support 12. Each line of holes 34 includes in its upper half two larger diameter holes 36 which increase the flexibility of the upper part of the back support 12. Additional, horizontally extending lines of holes 38 may be provided to increase the flexibility of the upper part of the back support.

The seat 14 similarly has its deformability modified. The flexibility of the rear part of the seat 14 is increased by two slits 40 and a centrally disposed slit 42 each extending forwards from the aperture 16 to define two portions 44 which can flex downwards. A row of holes 46 extending from side to side of the seat 14 in front of the slits 40 and 42 provides a line of weakness which increases the downward flexure of the portions 44 under the weight of a person sitting on the seat. A hole 48 in each portion 44 increases the softness of the portions and also decreases the pressure in use on the ischial tuberosities of the sitter.

A further line of holes 50 near the front of the seat 14 enables the front portion 52 of the seat to flex downwards. Larger-diameter holes 54 increase the softness of the front portion 52.

A strengthening flange 56 extends continuously around the side and top edges of the back support 12 and along the side edges of the seat 14. The flange 56 stops short of the front portion 52 of the seat 14, so as not to affect the flexibility of that portion. The flange 56 strengthens the chair shell, which might otherwise be unduly weakened by the various apertures formed in it. The strength of the chair shell at the junction of the back support 12 and seat 14 may be further strengthened by a supporting frame, as described below.

In use, when a person sits on the chair shell and rests his back against the back support 12, the pressure of the lower part of the user's back causes the portions 26 of the back support 12 to flex backwards, so that the lower part of the back support is deformed to a shape which is convex in vertical section. At the same time, the centre of the back support is moved backwards, the inner edge portions 26 being pushed backwards further than their outer edges, so that the concavity of the back support in horizontal section is increased, to provide "wrap-around" support to the back of the user to tend to hold it in the correct position. The two portions 26 can move to some extent independently of one another, so that the back support tends to assume the correct shape even if the user's back moves to one side or other of a central position. The holes 32, 34, 36 in the upper part 18 of the back support 12 modify its deformability so that, under pressure of the user's back, the upper part 18 tends to be deformed backwards to increase the convexity of the back support in vertical section and at the same time tends to increase its concavity in horizontal section.

The weight of the sitter's body deforms the portions 44 of the seat 14 downwardly to accommodate the ischial tuberosities. The portions 44 can move independently of one another, so that one portion can be pressed down more than the other if the sitter positions his body so that more of its weight is supported on that one portion. The front portion 52 is also deformed downwardly, so that the front of the seat dips away from the thighs, reducing pressure on the nerves and blood vessels coming through the popliteal space. The downward deformation of the rear and front portions of the seat 14 also tends to cause the middle portion of the seat, between the lines of holes 46 and 50 to bow upwards, so that the seat adopts, in front-to-rear section, an upwardly convex curve which is desirable in providing support for the thighs. Since, as mentioned above, the support of the spine in the S-shape alters the distribution of pressure exerted on the seat, it is important to design the deformability of seat 14 in conjunction with that of the back support 12 to give the correct interrelationship between the two.

The chair shell is thus deformed to a shape approximating to the ideal shape which supports the spine, particularly the lumbar vertebrae 80 and lower thoracic vertebrae 82, in the orthopaedically preferred concave curve, and at the same time properly supports the thighs and pelvis. The resilience provided by the increased deformability, particularly of the portions 26 in the lower part of the back support 12 and the portions 44 at the rear of the seat 14, increase the comfort of the chair shell without the need for thick upholstery.

When the sitter stands up, the deformed polypropylene chair shell recovers its original shape almost instantaneously, so that the chair is ready for immediate stacking. The undeformed shape of the chair shell is such that the shells can be easily stacked.

It will be appreciated that the chair shell

must be provided with a suitable supporting structure, which may take the form of a tubular metal frame 60 as shown in Figure 3. It is important that the supporting structure does not adversely interfere with the deformation of the shell under the weight of the user. The frame 60 has two side members 62 which are positioned at the sides of the seat 14, adjacent the flange 56, joined by front and rear members 64 and 66. The front member is positioned to the rear of the front part 52 of the seat 14 so as not to interfere with the flexible movement of the part 52. The rear member 66 is positioned in the aperture 16 of the chair shell 10. The two side members 62 extend rearwardly of the rear member 66 and curve upwards to form upright members 68, which extend partway up the back support 12 of the chair shell. The portions 68 strengthen the chair shell at the junction of the back support 12 and seat 14 and prevent excessive movement between the two. The frame includes two leg members 70, each consisting of two legs 72 joined by a cross-member 74 welded to the front and rear members 64 and 66. The cross-members 74 are thus positioned below the members 64 and 66 and so are separated from the seat 14 and do not interfere with its deformation. The chair shell 10 may be fixed by any suitable means to the frame 60, for example by bolts or rivets passing through holes in the shell and in the side members 62 of the frame.

It will be appreciated that the arrangement of holes in the chair shell could take different forms. The precise shape, dimensions and positions of the holes will depend on the thickness and normal flexibility of the material of the chair shell. As mentioned above, instead of holes, the weaknesses in the shell could be formed by other means, such as grooves or recesses formed in the rear surface of the chair shell.

In addition to the stackable chair described, the invention could be applied to other non-upholstered furniture, such as garden furniture, and also to lightly upholstered furniture. The invention could for example be applied to aircraft seats, with the advantage of reducing the amount of upholstery required as compared with conventional aircraft seats, and therefore reducing the amount of inflammable material in the seat. The same advantage could be obtained in domestic furniture using the shell of the invention with a thin covering of foam upholstery. A chair could, for example, be provided with false sides to give the chair the same appearance as a conventionally upholstered chair. The invention could also be applied to seats of width large enough to accommodate two or more people, for example to settees or bench seats. In that case, the shape and distribution of the zones of weakness would need to be arranged so that the part of the seat on which the user sat would deform to the appropriate shape irrespective of the precise location of the sitter and of the effects of the weight of another person at a different location on the seat. The back support and the seat could be made separately and joined together by a suitable locking hinge, so that the chair shell could be employed, with a suitable supporting structure, in a seat with a folding back or seat portion, for example a theatre seat or vehicle seat.

It will be appreciated that the shape of the chair shell could be different from that of the described embodiment. For example, the back support and the seat could be completely flat in the undeformed shape, without the initial slight curvatures of the described embodiments. The shape could be altered to suit other applications of the invention, as mentioned above. For example, the angle between the back support and the seat could be altered to suit the use to which the chair shell is to be put.

Claims

1. A chair shell of resilient material comprising a back support (12) and a seat (14), the back support (12) in its undeformed state having a shape which, seen from the front, is flat or slightly convex in vertical section and is flat or slightly concave in horizontal section, the back support (12) having an upper part which, when flexed under pressure from the back of a sitter is resiliently deformed to increase the convexity in vertical section and the concavity in horizontal section of the back support (12), characterised in that the upper part of the back support (12) has zones of weakness arranged to modify the deformability of the back support (12) so as to control the resilient deformation of the upper part of the back support (12) under pressure from the back of a sitter, whereby the deformed shape of the back support includes, in vertical section, a convex curve positioned to support the sitter's spine in a convex curve in the lumbo-sacral region, the chair shell has an opening (16) at the junction of the back support (12) and seat (14), the back support (12) has a lower part divided into two portions (26) by a centrally disposed slit (24) which extends upwards from the opening (16), the two portions (26) being adapted to flex resiliently under pressure from the back of a sitter in such a manner that the lower edges of the two portions (26) move backwards to increase the convexity of the back support (12) in vertical section and the inner edges of the two portions (26) move backwards to increase the concavity of the back support (12) in horizontal section, and in that the seat (4) has a rear portion (44) adapted to be deformed resiliently downwards under pressure from the ischial tuberosities of the sitter, and a front portion (52) adapted to be deformed resiliently downwards under pressure from the under-thighs of the sitter.

2. A chair shell as claimed in claim 1, characterised in that the lower part of the back

support (12) is formed with further slits (22) extending upwardly from the opening (16) and positioned on either side of the centrally disposed slit (24) near the sides of the back support.

3. A chair shell as claimed in claim 1 or claim 2, characterised in that a line of weakness (28) is formed in the back support (12) which extends horizontally across the back support (12) at the junction of the upper part and lower part of the back support (12).

4. A chair shell as claimed in any preceding claim, characterised in that the rear portion of the seat (14) is divided into two independently movable portions (44) by a slit (42) extending forwards from the opening (16) at the junction of the seat (14) and the back support (12).

5. A chair shell as claimed in claim 4, characterised in that each of the two independently movable portions (44) of the seat (14) is formed with an aperture (48) positioned to relieve pressure on the ischial tuberosities of the sitter.

6. A chair shell as claimed in any preceding claim, characterised in that in which each of the two portions (26) of the lower part of the back support (12) is formed with an aperture (30) to increase the softness of said portion (26).

7. A chair shell as claimed in any preceding claim, in that the upper part of the back support (12) is formed with two lines of weakness (34, 36) extending from a point near the centre of the back support (12) to points near the upper right and left corners respectively of the back support (12).

8. A chair shell as claimed in any preceding claim, characterised in that the back support (12) in its undeformed state has a shape which is convex in vertical section and concave in horizontal section.

9. A chair shell as claimed in any preceding claim, characterised in that the zones of weakness in the back support (12) comprise lines of weakness including lines of holes (28, 32, 34, 36, 38) formed in the back support (12).

10. A chair shell as claimed in any preceding claim, characterised in that the material of the chair shell is a crystalline propylene polymer.

11. A chair shell as claimed in claim 10, characterised in that the material is a homopolymer or copolymer of propylene with up to 18% by weight of ethylene.

12. A chair comprising a chair shell (10) as claimed in any preceding claim fixed to a supporting frame (60).

Revendications

1. Coque de siège en matériau élastique, comprenant un dossier (12) et une assise ou siège proprement dit (14), le dossier (12) ayant, dans son état non déformé, une forme qui, vue de l'avant, est plate ou légèrement convexe en section verticale et est plate ou légèrement concave en section horizontale, le dossier (12) ayant une partie supérieure qui, lorsqu'elle est fléchie sous la pression du dos d'une personne assise, est déformée élastiquement de façon à augmenter la convexité en section veticale et la concavité en section horizontale du dossier (12), caractérisée en ce que la partie supérieure du dossier (12) possède des zones d'affaiblissement agencées de façon à modifier la déformabilité du dossier (12) de façon à régir la déformation élastique de la partie supérieure du dossier (12) sous la pression du dos de la personne assise, ce grâce à quoi la forme déformée du dossier comprend, en section verticale, une courbe convexe située de manière à supporter la colonne vertébrale de la personne assise en une courbe convexe dans la région lombo-sacrée, la coquille de siège possède une ouverture (16) à la jonction du dossier (12) et de l'assise (14), le dossier (12) a une partie inférieure divisée en deux portions (26) par une fente (24), disposée centralement, qui s'étend vers le haut à partir de l'ouverture (16), les deux portions (26) étant agencées pour fléchir élastiquement sous la pression du dos de la personne assise de telle manière que les bords inférieurs des deux portions (26) se déplacent vers l'arrière en augmentant la convexité du dossier (12) en section verticale et que les bords inférieurs des deux portions (26) se déplacent vers l'arrière en augmentant la convexité du dossier (12) en section horizontale, et en ce que l'assise (14) possède une partie arrière (44), agencée de manière à se déformer élastiquement vers le bas sous la pression des tubérosités ischiatiques de la personne assise, et une partie avant (52) agencée de manière à se déformer élastiquement vers le bas sous la pression de la partie inférieure des cuisses de la personne assise.

2. Coque de siège selon la revendication 1, caractérisée en ce que la partie inférieure du dossier (12) comporte d'autres fentes (22) qui s'étendent vers le haut à partir de l'ouverture (16) et qui sont situées de part et d'autre de la fente centrale (24), près des côtés du dossier.

3. Coque de siège selon la revendication 1 ou la revendication 2, caractérisée en ce qu'il est formé, dans le dossier (12), une ligne d'affaiblissement (28) qui s'étend horizontalement en travers du dossier (12), à la jonction de la partie supérieure et de la partie inférieure du dossier (12).

4. Coque de siège selon l'une quelconque des revendications précédentes, caractérisée en ce que la partie arrière de l'assise (14) est divisée, en deux portions (44) mobiles indépendamment, par une fente (42) qui s'étend vers l'avant à partir de l'ouverture (16), à la jonction de l'assise (14) et du dossier (12).

5. Coque de siège selon la revendication 4, caractérisée en ce que chacune des deux portions (44), mobiles indépendamment, de l'assise (14) comporte une ouverture (48) située de façon à atténuer la pression sur les tubérosités ischiatiques de la personne assise.

6. Coque de siège selon l'une quelconque des revendications précédentes, caractérisée en ce que chacune des deux portions (26) de la partie inférieure du dossier (12) comporte une ouverture (30) pour augmenter la souplesse de ladite portion (26).

7. Coque de siège selon l'une quelconque des revendications précédentes, caractérisée en ce que la partie supérieure du dossier (12) comporte deux lignes d'affaiblissement (34, 36) qui s'étendent d'un point proche du centre du dossier (12) à des points proches des coins supérieurs droit et gauche respectivement du dossier (12).

8. Coque de siège selon l'une quelconque des revendications précédentes, caractérisée en ce que, dans son état non déformé, le dossier (12) a une forme qui est convexe en section verticale et concave en section horizontale.

9. Coque de siège selon l'une quelconque des revendications précédentes, caractérisée en ce que les zones d'affaiblissement du dossier (12) comprennent des lignes d'affaiblissement dont des lignes de trous (28, 32, 34, 36, 38) formées dans le dossier (12).

10. Coque de siège selon l'une quelconque des revendications précédentes, caractérisée en ce que le matériau de la coque de siège est un polymère de propylène cristallin.

11. Coque de siège selon la revendication 10, caractérisée en ce que le matérlau est un homopolymère ou copolymère comprenant jusqu'à 18% en poids d'éthylène.

12. Siège comprenant une coque de siège (10) selon l'une quelconque des revendications précédentes, fixée à un châssis porteur (60).

Patentansprüche

1. Stuhlsitzschale aus elastischem Material, mit einer Rückenstütze (12) und einem Sitz (14), von denen die Rüchenstütze (12) im unverformten zustand eine Form aufweist, welche, von vorn gesehen eben oder leicht konvex im senk rechten Schnitt und eben oder leicht konkav im waagerechten Schnitt ist, wobei die Rückenstütze (12) ein oberes Teil hat, welches bei Durchbiegung unter dem Druck des Rückens eines Sitzenden elastisch verformt wird, so daß die Konvexität im senkrechten Schnitt und die Konkavität im waagerechten Schnitt der Rückenstütze (12) verstärkt wird, dadurch gekennzeichnet, daß das obere Teil der Rückenstütze (12) schwächungsbereiche aufweist, welche zur Beeinflussung der Verformbarkeit der Rückenstütze (12) derart angeordnet sind, daß sie die elastische Verformung des oberen Teils der Rückenstütze (12) unter dem Druck des Rückens eines Sitzenden beeinflussen, wodurch die verformte Gestalt der Rückenstütze im senkrechten Schnitt eine konvexe Kurve aufweist, welche so angeordnet ist, daß sie das Rückgrat des Sitzenden in einer konvexen Kurve in der Kreuz- und Beckenregion abstützt, daß die Stuhlsitzschale eine Öffnung (16) im Verbindungsbereich zwischen der Rückenstütze (12) und dem Sitz (14) hat, daß die Rückenstütze (12) ein durch einen mittig angeordneten, sich von der Öffnung (16) aufwärts erstreckenden Schlitz (24) in zwei Teile (26) unterteiltes unters Teil hat, wobei die beiden Teile (26) unter dem Druck des Rückens des Sitzenden in einer solchen Weise elastisch verbiegbar sind, daß die unteren Ränder der beiden Teile (26) sich zur Verstärkung der Konvexität der Rückenstütze (12) im senkrechten Schnitt rückwärts bewegen und die inneren Ränder der beiden Teile (26) sich zur Verstärkung der Konkavität der Rückenstütze (12) im waagerechten Schnitt Rückwärts bewegen, und daß der Sitz (4) ein unter dem Druck der Beckenknochen des Sitzenden abwärts verformbares hinteres Teil (44) und ein unter dem Druck der Oberschenkel des Sitzenden elastisch abwärts verformbares vorderes Teil (52) aufweist.

2. Stuhlsitzschale nach Anspruch 1, dadurch gekennzeichnet, daß das untere Teil der Rückenstütze (12) weitere darin geformte Schlitze (22) aufweist, welche sich von der Öffnung (16) aufwärts erstrecken und beiderseits des mittig angeordneten Schlitzes (24) nahe den Seiten der Rückenstütze angeordnet sind.

3. Stuhlsitzschale nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß in der Rückenstütze (12) eine Schwächungslinie (28) geformt ist, welche sich im Verbindungsbereich zwischen dem oberen und dem unteren Teil der Rückenstütze (12) waagerecht über die Rückenstütze (12) erstreckt.

4. Stuhlsitzschale nach einem der vorstehenden Ansprüche, dadurch gekennzeichnet, daß das hintere Teil des Sitzes (14) durch einen sich von der Öffnung (16) im Verbindungsbereich zwischen dem Sitz (14) und der Rückenstütze (12) vorwärts erstreckenden Schlitz (42) in zwei unabhängig voneinander bewegbare Teile (44) unterteilt ist.

5. Stuhlsitzschale nach Anspruch 4, dadurch gekennzeichnet, daß jeder der unabhängig voneinander bewegbaren Teile (44) des Sitzes (14) eine Öffnung zur Druckentlastung der Beckenknochen des Sitzenden aufweist.

6. Stuhlsitzschale nach einem der vorstehenden Ansprüche, dadurch gekennzeichnet, daß jedes der beiden Teile (26) des unteren Teils der Rückenstütze (12) eine Öffnung (30) zur Erhöhung der Nachgiebigkeit des Jeweiligen Teils (26) hat.

7. Stuhlsitzschale nach einem der vorstehenden Ansprüche, dadurch gekennzeichnet, daß im oberen Teil der Rückenstütze (12) zwei Schwächungslinien (34, 36) geformt sind, welche sich von einer Stelle nahe der Mitte der Rückenstütze (12) zu nahe den oberen rechten bzw. linken Ecken der Rückenstütze (12) gelegenen Stellen erstrecken.

8. Stuhlsitzschale nach einem der vorstehenden Ansprüche, dadurch gekennzeichnet, daß die Rückenstütze (12) im unverformten Zu-

stand eine im senkrechten Schnitt konvexe und im waagerechten Schnitt konkave Form aufweist.

9. Stuhlsitzschale nach einem der vorstehenden Ansprüche, dadurch gekennzeichnet, daß die Schwächungsbereiche in der Rückenstütze (12) Schwächungslinien umfassen, welche Reihen von in der Rückenstütze (12) geformten Löchern (28, 32, 34, 36, 38) aufweisen.

10. Stuhlsitzschale nach einem der vorstehenden Ansprüche, dadurch gekennzeichnet, daß das Material der Stuhlsitzschale ein kristallinisches Propylenpolymer ist.

11. Stuhlsitzschale nach Anspruch 10, dadurch gekennzeichnet, daß das Material ein Propylen-Homopolymer oder -Mischpolymer mit bis zu 18 Gew.% Äthylen ist.

12. Stuhl mit einer Stuhlsitzschale (10) nach einem der vorstehenden Ansprüche, welche an einem tragenden Rahmen (60) befestigt ist.

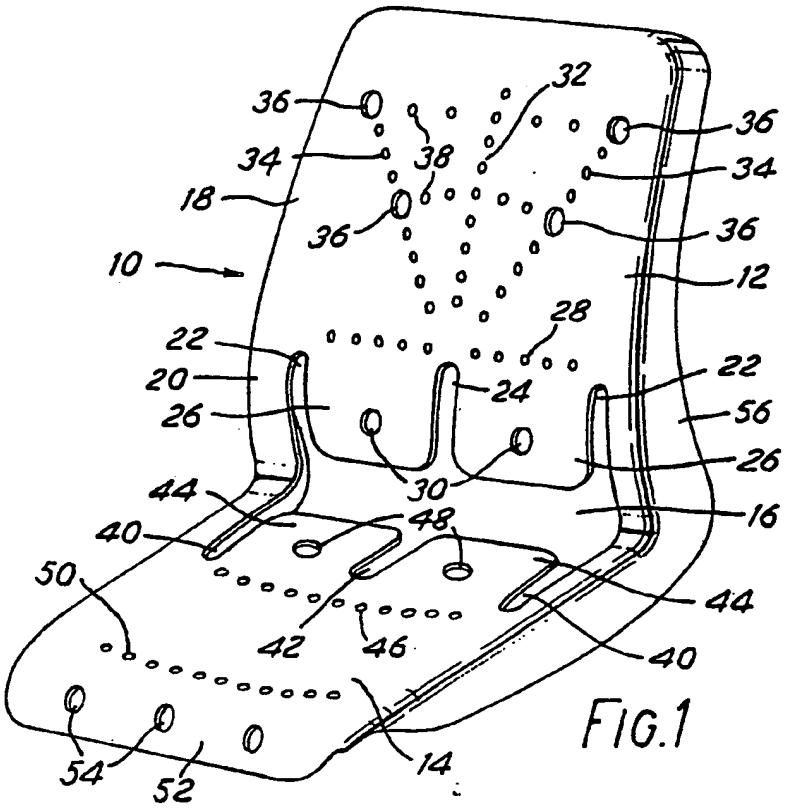

FIG.1

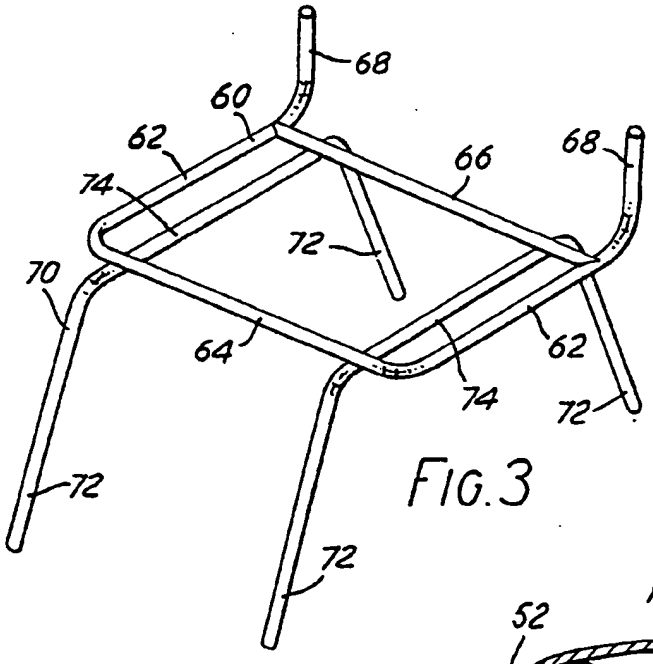

FIG.3

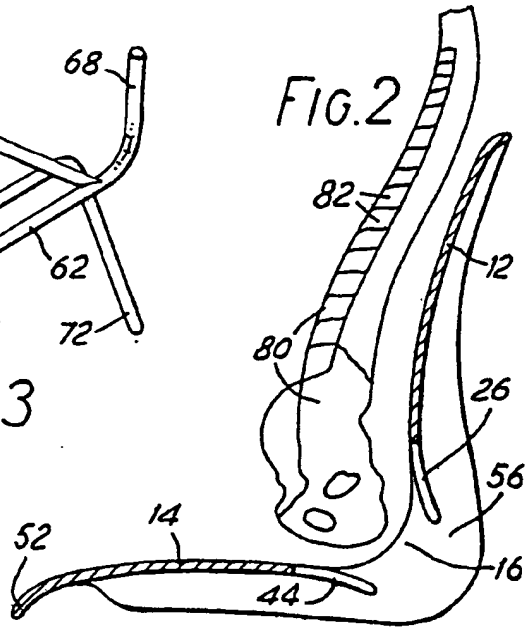

FIG.2